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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,647	04/21/2004	Sharat Singh	033.09-2US	5824

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EXAMINER	
TUNG, JOYCE	
ART UNIT	PAPER NUMBER
1637	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/828,647	SINGH ET AL.	
	Examiner	Art Unit	
	Joyce Tung	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The applicant's response filed 11/16/06 to the Office action has been entered. Claims 21-30 are pending.

1. The rejection of claims 21-30 under 35 U.S.C. 112, second paragraph, in section 7(b)-(c) is withdrawn because of the amendment.

2. The rejection of claims 21-30 under 35 U.S.C. 112, second paragraph in section 7(a) is maintained. The response argues that the specification provides a definition of the phrase "aggregation". However, the specification just states that the proteins may present as individual proteins or combined in various aggregations, such as organelles, cells, viruses, etc (See [0209]). Thus claims 21-30 are still vague and indefinite because it is unclear what is encompassed by the phrase "aggregation".

3. Claims 21-30 remain respectively or provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 21-30 of copending Application No. 10/779255, over claims 1-7 of U.S. Patent No. 6,770439, over claims 1-13 of U.S. Patent No. 7017125 and over claims 1-20 of U.S. Patent No. 6673550 because the terminal disclaimer was not filed.

4. Claims 21-22, 24, and 28 remain rejected under 35 U.S.C. 102(b) as being anticipated by Grossman et al. (US 5,470,705, issued November 28, 1995).

Grossman et al. disclose a probe composition of detecting a plurality of different sequences in a target sequence involving a plurality of sequence probes (See column 2, lines 54-64 and column 6, lines 46-54). The number of the probes is six probes, which are added to a target polynucleotide (See column 20, lines 49-51). The probe used in the method has the

features of the electrophoretic probe cited in the instant claim 21. The probe includes a binding polymer, a polymer chain that imparts to that probe, a distinctive ratio of charge/translational frictional drag and a reporter attached to the binding polymer (See column 20, lines 52-57). The binding polymer is an oligonucleotide including at least 10-20 bases allowing hybridization to the target polynucleotide (See column 6, lines 66-67 and column 7, lines 1-10). Other binding polymers are analogs of polynucleotides, such as deoxynucleotides with thiophosphodiester linkage (See column 7, lines 11-19). The polymer chain has a ratio of charge/translational frictional drag, which is evidenced by a distinctive electrophoretic mobility in a non-sieving matrix (See column 7, lines 50-64). The polymer chain can be polyethylene oxide (PEO) or a polypeptide chain where the chains are attached to different-sequence binding polymers (See column 3, lines 11-18). The teachings suggest that the charge/translational frictional drag is consisted of carbon, hydrogen, oxygen, phosphorus, nitrogen, sulfur and boron.

The second reagent is not defined in the claim. However, Grossman et al. disclose that the probe is cleaved by 5'to 3' exonuclease (See column 20, lines 15-25). The exonuclease is interpreted as the second reagent, which is capable of generating an active species to cleave the cleavable linkage.

Moreover, since the aggregation is not defined, the features of Grossman et al.'s probe has the features of the claimed electrophoretic probe, the teachings of Grossman et al. anticipate the limitations of the claims.

The response argues that Grossman et al. et al. do not disclose probes having a cleavable linkage L. Grossman et al. et al. disclose that as polymerase reaches the 5' end of the adjacent probe, it cleaves off the 5' end subunits from the probe. Cleavage of the subunit from the probe

releases a labeled probe (See column 20, lines 19-26). Moreover, since there is no definition regarding the phrase "cleavable linkage", any connection in the probe reads on the limitation of the phrase. Thus the teachings of Grossman et al. anticipate the limitations of the claims. The rejection is maintained.

5. Claims 21-25, and 27-29 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Van Ness et al. (6,027,890) in view of Grossman et al. (US 5,470,705, issued November 28, 1995).

Van Ness et al. disclose a variety of first and second member of a ligand pairs in which one or more members used in the method is tagged (See column 2, lines 14-27) and the tag is cleavable by oxidation (See column 4, lines 16-24). The ligand pair can be an antibody or antibody fragment or nucleic acid molecule/nucleic acid molecule (See column 2, lines 29-44). The tag is detectable by non-fluorescent spectrometry, or potentiometry (See column 2, lines 55 to column 3, lines 1-8) or the tag can be fluorescent labeled and detected by fluorometer (See column 3, lines 37-40). The labile linking group has thioethers, disulfide formation (See column 37, lines 12-26) and sulfoxide (See column 34, lines 39-46). There are more than 500 different and unique tagged molecules and each tag is unique for a selected nucleic acid fragment or first or second member and may be separately identified (See column 3, lines 29-36). The bound member and unbound member are separated by electrophoresis (See column 3, lines 58-67). The member ligand pair of Van Ness has the same components of the probe set.

However, Van Ness et al. do not disclose the ligand pair having a mobility modifier, which produces a unique electrophoretic mobility.

Grossman et al. disclose that the probe includes a binding polymer, a polymer chain which imparts to that probe, a distinctive ratio of charge/translational frictional drag and a reporter attached to the binding polymer (See column 20, lines 52-57). Grossman et al. also disclose that a ratio of charge/translation frictional drag is distinctive for each different-sequence probe in which addition of charge groups to the polymer chain or the subunit length of the polymer chain can be used to achieve selected ratio of charge/translation frictional drag (See column 11, lines 34-43) and the electrophoretic movement in a non-sieving medium can finely resolved by derivatization with polymer chain having slightly different size and /or charge differences (See column 11, line 46-51).

One of ordinary skill in the art would have been motivated to apply the mobility modifier of Grossman et al., the ratio of charge/translation frictional drag to the ligand pair of Van Ness et al. because as taught by Grossman et al. the ratio of charge/translation frictional drag is distinctive for each different-sequence probe and the electrophoretic movement in a non-sieving medium can finely resolved by derivatization with polymer chain having slightly different size and /or charge differences (See column 11, line 46-51). It would have been prima facie obvious to have the mobility modifier in the ligand pair of Van Ness et al. to make the claimed probe in the composition.

The response argues that Grossman et al. do not disclose electrophoretic probes having a cleavable linkage L. However, as disclosed by Van Ness et al., the labile linking group has thioethers, disulfide formation (See column 37, lines 12-26) and sulfoxide (See column 34, lines 39-46).

The response further argues that the cited art does not provide a motivation to combine the teachings in that the ratio of charge/translation frictional drag is distinctive for each probe and the electrophoretic movement can be resolved. However, Van Ness et al. disclose that there are more than 500 different and unique tagged molecules and each tag is unique for a selected

nucleic acid fragment or first or second member and may be separately identified (See column 3, lines 29-36). Grossman et al. also disclose that a ratio of charge/translation frictional drag is distinctive for each different-sequence probe in which addition of charge groups to the polymer chain or the subunit length of the polymer chain can be used to achieve selected ratio of charge/translation frictional drag (See column 11, lines 34-43) and the electrophoretic movement in a non-sieving medium can finely resolved by derivatization with polymer chain having slightly different size and /or charge differences (See column 11, line 46-51). It would have been prima facie obvious to have the mobility modifier in the ligand pair of Van Ness et al. to make the claimed probe in the composition. Thus, the rejection is maintained.

6. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grossman et al. (US 5,470,705, issued November 28, 1995) as applied to claims 21-22, 24, and 28 above and over Van Ness et al. (6,027,890) in view of Grossman et al. (US 5,470,705, issued November 28, 1995) as applied to claims 21-25, and 27-29.

The teachings of Grossman et al. and Van Ness et al. are set forth in sections 4-5 above. Grossman et al. do not disclose the molecular weight of the mobility modifier recited as the range of from 30-3000 daltons.

Grossman et al. disclose a probe composition of detecting a plurality of different sequences in a target sequence involving a plurality of sequence probes (See column 2, lines 54-64 and column 6, lines 46-54). The number of the probes is six probes, which are added to a target polynucleotide (See column 20, lines 49-51).

Grossman et al. do not explicitly disclose the molecular weight of the mobility modifier. However, the binding polymer and polymer chain contribute to the mobility modifier of probe (See column 3, lines 55-64,). The polymer chain may be polyethylene oxide (PEO) or a

polypeptide chain (See column 3, lines 11-18, column 7, lines 39-49). Since these molecules are small molecules, the teachings are inherent that the molecular weight of the mobility modifier would be from 150-5000 Daltons.

One of ordinary skill in the art would have been motivated to apply the molecule weight of binding polymer and polymer chain used in the method of Grossman et al. because Grossman et al. disclose that the binding polymer and polymer chain contribute to the mobility modifier of the probe (See column 3, lines 55-64), the mobility modifier is distinctive for each different-sequence probe (See column 11, lines 34-43) and the electrophoretic movement in a non-sieving medium can finely resolved by derivatization with polymer chain (See column 11, line 46-51). It would have been prima facie obvious to apply the mobility modifier with the molecular weight in the range of from 30-3000 daltons to make the probe in the composition.

The response argues that Grossman et al. do not disclose electrophoretic tag having a cleavable linkage L. As discussed in sections 4-5 above, with the same reasons as set forth in sections 4-5, the rejection is maintained.

7. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Grossman et al. (5,470,705, issued November 28, 1995) as applied to claims 21-22, 24 and 28 above, and over Van Ness et al. (6,027,890) in view of Grossman et al. (US 5,470,705, issued November 28, 1995) as applied to claims 21-25, and 27-29, further in view of further in view of Breslow et al. (6,331,530, issued Dec 18, 2001).

The teachings of Grossman et al. and Van Ness et al. are set forth in sections 4-5 above. None of the references addresses the cleavable linkage, which is cleaved by singlet oxygen.

Breslow et al. disclose a linker between two β-cyclodextrin molecules and that a photosensitizer is encapsulated within a matrix, wherein the cleavable linker is cleaved upon

exposure to light (See the abstract). Singlet oxygen is produced to cleave the linker (See column 3, lines 47-51).

One of ordinary skill in the art would have been motivated to apply the cleavable linker, which is cleaved upon exposure to light because the active cleaving agent, singlet oxygen is used in the system of Breslow et al. for cancer therapy and this suggests that the active cleaving agent must be very efficient. Thus, it would have been prima facie obvious to apply the cleavable linker, which is cleaved by singlet oxygen as taught by Breslow et al. to make the claimed probe set.

The response argues that Breslow et al. do not disclose electrophoretic probes having a cleavable linkage L. As discussed in sections 4-5 above, with the same reasons as set forth in sections 4-5, the rejection is maintained.

Summary

8. No claims are allowable.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joyce Tung whose telephone number is (571) 272-0790. The examiner can normally be reached on Monday - Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joyce Tung J. T.
January 23, 2007

KENNETH R. HORLICK, PH.D
PRIMARY EXAMINER

1/24/07